IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	A.D. Baker et al.
Case:	19-3
Serial No.:	09/484,098
Filing Date:	January 18, 2000
Group:	2157
Examiner:	Gregory G. Todd
Title:	Methods and Apparatus for Local Network Address Acquisition, Analysis and Substitution

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature: _____ Date: October 20, 2004

SECOND SUPPLEMENTAL APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Second Supplemental Appeal Brief is submitted in response to the Office Action dated July 20, 2004 in the above-referenced application, in which the Examiner reopened prosecution in response to the Supplemental Appeal Brief filed March 31, 2004.

Applicants have submitted concurrently herewith a response to the Office Action, requesting reinstatement of the appeal.

REAL PARTY IN INTEREST

The present application is currently assigned to Avaya Inc. Avaya Inc. is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

STATUS OF CLAIMS

Claims 1-21 are pending in the present application. Each of claims 1-21 stands rejected under 35 U.S.C. §102(e) or 35 U.S.C. §103(a). Claims 1-21 are appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF INVENTION

The present invention is directed to an apparatus, method and machine-readable storage medium for use in interfacing a local network to one or more external network elements.

An illustrative embodiment of the invention is shown in FIG. 1 of the drawings, and includes a local area network (LAN) 102 and a gateway 110. The LAN 102 is coupled to personal computers PC-1, PC-2, . . . PC-N, a printer 104 and a file server 106. The gateway 110 communicates via a DSL access multiplexer (DSLAM) 112 with external networks 114 and 116.

As indicated on page 4, lines 9-13 of the specification, a significant problem associated with a conventional gateway in a system such as that of FIG. 1 is that IP address disparity can arise between the personal computers, printer, file server or other devices attached to the LAN 102, such that direct communications between these devices are routed through one or more of the external networks 114 and 116. This is clearly undesirable in that it unnecessarily consumes network and gateway processing resources.

The present invention solves this significant problem of the prior art by implementing an address substitution mechanism in the gateway 110. Generally, the gateway is configured to determine remotely-assigned address information for a given device attached to the LAN, and to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

The address substitution mechanism in the illustrative embodiment is described as follows at page 4, lines 14-23 of the specification:

In accordance with the invention, gateway 110 is configured to intercept and store all address assignments issued by a remote network address server during an IP address assignment process, e.g. during a designated IP address exchange interval. The gateway 110 will then "trap" all incoming requests during, e.g., capabilities identification exchanges, and reissue the requests after evaluating and potentially adjusting the address fields thereof to a format suitable to each of the other devices on the LAN 102. Finally, at transport service time, the gateway 110 will receive individual message requests from devices on the LAN 102, map their addresses to appropriate substitution addresses, and reissue the messages with the altered addresses.

The address substitution mechanism implemented in the gateway 110 thus advantageously ensures that communications between devices attached to the local network are not routed through an external network as a result of disparity in their remotely-assigned IP addresses.

ISSUES PRESENTED FOR REVIEW

1. Whether claims 1-3, 5-13 and 15-21 are anticipated under 35 U.S.C. §102(e) by U.S. Patent No. 6,563,824 (hereinafter "Bhatia").

2. Whether claims 4 and 14 are unpatentable under 35 U.S.C. §103(a) over Bhatia in view of U.S. Patent No. 6,493,348 (hereinafter "Gelman").

GROUPING OF CLAIMS

With regard to Issue 1, claims 1-3, 5, 9,11-13, 15, 19 and 21 stand or fall together, claims 6, 7, 16 and 17 stand or fall together, claims 8 and 18 stand or fall together, and claims 10 and 20 stand or fall together.

With regard to Issue 2, claims 4 and 14 stand or fall together.

ARGUMENT

Issue 1

The Manual of Patent Examining Procedure (MPEP), Eight Edition, August 2001, §2131, specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). For the reasons identified below, Applicants submit that the Examiner has failed to establish anticipation of claims 1-3, 5-13 and 15-21 by the Bhatia reference.

As indicated above, independent claim 1 calls for a gateway coupled between a local network and one or more external network elements, and operative to perform the following functions:

(i) to determine remotely-assigned address information for a given device attached to the local network; and

(ii) to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

It is important to note that the substitution address, determined for the given device from the remotely-assigned address information for that device, is used by at least one other device attached to the local network when communicating with the given device. This has the advantageous effect of preventing communications directed between the given device and the other device from traversing a remote network in a situation in which there are disparities in remotely-assigned address information between the two devices.

In the illustrative embodiment mentioned previously, the gateway is configured to intercept communications from devices on the local network in order to determine remotely-assigned IP address information for those devices. After such information is determined for a given device, the gateway creates a set of address substitution information that includes sub-network compatible addresses for use by other devices on the local network when communicating with the given device.

The substitution addresses are then used in subsequent communications between the devices on the local network, thereby ensuring that communications between these devices are not routed through the external network.

The Examiner in formulating the §102(e) rejection relies on the teachings in column 6, lines 9-60 of Bhatia. More specifically, the Examiner argues that the LAN modem 300 corresponds to the claimed gateway, and that the routing arrangement shown in FIG. 2C, as implemented by LAN modem 300, meets all of the limitations of claim 1. Applicants respectfully disagree, for the reasons identified below.

Applicants initially note that the Bhatia reference is directed to a different problem than the claimed invention, namely, the problem of maintaining remote accessibility to devices on a local area network, from different remote networks, in the presence of session changes. See Bhatia at, for example, column 1, lines 10-18, column 1, line 65, to column 2, lines 14-28. Thus, the routing arrangement implemented by Bhatia relates specifically to maintaining communication capabilities between a given device, on a local network, and one or more remote networks, in the presence of any session changes that may arise. Bhatia does not appear to be concerned with the particular problem addressed by the present invention, which, as indicated previously, is preventing communications between a given device on a local network and another device on that network from unnecessarily traversing a remote network.

The Examiner states, with reference to FIG. 2C of Bhatia, that the remotely-assigned address information of the given device in claim 1 is the address 192.168.1.1. The Examiner further states that the substitution address of claim 1 corresponds to one of the addresses 192.168.1.4 or 192.168.1.5 assigned to respective users $User_9$ and $User_{10}$ at respective workstations 10_i and 10_j in FIG. 2C, allegedly based on the address 192.168.1.1. See the Office Action at page 3, section 3. However, these statements are believed to be incorrect. First, the Bhatia reference indicates that the particular address 192.168.1.1 is a private IP address of the LAN modem 300, and not an address assigned to a local workstation by an ISP as alleged by the Examiner. Also, the Bhatia reference indicates that the addresses 192.168.1.1, 192.168.1.4 and 192.168.1.5 are private IP addresses. Moreover, Bhatia clearly indicates that such private IP addresses are not remotely-assigned

addresses, but instead are assigned by the LAN 300. This is apparent from, for example, the following passage in column 5, lines 24-34 (emphasis supplied):

> [A]s each user logs onto the LAN through a corresponding workstation 10_e or 10_f, LAN modem 300 dynamically assigns an available private IP address to the workstation for that user. Accordingly, workstations 10_e and 10_f are assigned private IP addresses 192.168.1.2 and 192.168.1.4, respectively; with LAN modem 300 having private IP address 192.168.1.1. The LAN modem maintains a list of private IP addresses available for local use by workstations (or other networked devices) connected to the LAN. None of these private addresses is ever routed beyond the LAN.

The Examiner in the Office Action thus incorrectly states that address 192.168.1.1 is assigned to a workstation by an ISP. See the Office Action at page 3, section 3, lines 10-11. The Bhatia reference at column 6, lines 16-19, indicates that the address assigned by the ISP to $User_7$ at workstation 10_g is the address 198.6.1.1, and not the address 192.168.1.1 as alleged.

Applicants further note that the relied-upon portion of Bhatia, at column 6, lines 9-60, relates to address translation in the context of communications between a device, on a local network, and one or more remote networks. See Bhatia at, for example, column 6, lines 29-35. Such arrangements fail to teach or suggest the claimed arrangement in which a substitution address, determined for a given device on a local network from remotely-assigned address information for that device, is used by at least one other device attached to the local network when communicating with the given device.

Since Bhatia fails to teach or suggest each and every limitation of claim 1 in as complete detail as is contained in the claim, as required by the above-cited MPEP §2131, claim 1 is not anticipated by Bhatia.

Independent claims 11 and 21 are believed allowable for substantially the same reasons identified above with regard to independent claim 1.

Dependent claims 2, 3, 5-10, 12, 13 and 15-20 are believed allowable for at least the reasons identified above with regard to their respective independent claims. Moreover, these dependent

claims are believed to define additional separately-patentable subject matter relative to the Bhatia reference, as described in greater detail below.

With regard to claims 6 and 16, each of these claims specifies that the gateway stores a set of address substitution information for each of the plurality of devices, with the set of address substitution information for a given one of the devices comprising an address to be used by the given device in communicating with the gateway and addresses to be used by the given device in communicating with each of the other devices. The Examiner in the Office Action at page 4 argues that these limitations are met by the teachings in column 11, lines 9-66, and column 12, lines 51-61, of Bhatia. However, these teachings relating to public and private IP addresses fail to meet the specific language of the claim. More specifically, the cited portions of Bhatia do not disclose storing a set of address substitution information for each of a plurality of devices attached to a local network, with the address substitution information providing separate addresses for use by the given device in communicating with the gateway and with other devices attached to the same local network.

With regard to claims 8 and 18, each of these claims specifies that a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element. As noted above, the address translation arrangements in Bhatia are not configured to avoid routing through external routing elements in the particular manner claimed.

With regard to claims 10 and 20, each of these claims specifies that the gateway intercepts at least one of control information and maintenance information received over the local network and associated with the given device so as to perform related services on behalf of the given device. The Examiner in the Office Action at page 5 argues that these limitations are met by the teachings in column 10, line 48, to column 11, line 7, of Bhatia. However, the cited portions fail to make any mention of interception of control information or maintenance information, or of the claimed performance of related services on behalf of a local device.

Issue 2

A proper *prima facie* case of obviousness requires that the cited references when combined must "teach or suggest all the claim limitations," and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §706.02(j).

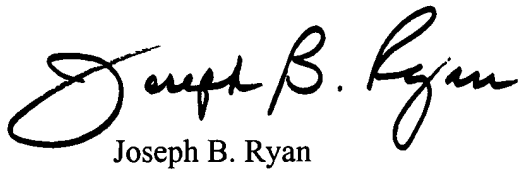
Applicants submit that the Examiner has failed to establish a proper *prima facie* case of obviousness in the present §103(a) rejection, in that the Bhatia and Gelman references, even if assumed to be combinable, fail to teach or suggest all the claim limitations, and in that no cogent motivation has been identified for combining the references or modifying the reference teachings to reach the claimed invention.

As noted above, Bhatia fails to teach the particular address substitution mechanism that is set forth in independent claims 1 and 11, from which respective claims 4 and 14 depend. Gelman fails to supplement this fundamental deficiency of Bhatia. Accordingly, it is believed that the proposed combination fails to meet the limitations of claims 4 and 14.

Moreover, the combined teachings of Bhatia and Gelman fail to disclose a gateway device comprising an ATU-R device with the particular functionality claimed. Although Gelman mentions the use of an ATU-R, it fails to specifically suggest the incorporation of the claimed address substitution functionality into an ATU-R device. It therefore appears that the Examiner in rejecting claims 4 and 14 has simply undertaken a hindsight-based reconstruction of the claimed invention, with the benefit of the disclosure provided by Applicants.

In view of the foregoing, Applicants believe that claims 1-21 are in condition for allowance, and respectfully request the withdrawal of the §102(e) and §103(a) rejections.

Respectfully submitted,



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APPENDIX

1. (Amended) An apparatus for use in interfacing a local network to one or more external network elements, the apparatus comprising:

a gateway coupled between the local network and the one or more external network elements, the gateway being operative to determine remotely-assigned address information for a given device attached to the local network; and to establish, based at least in part on the remotely-assigned address information, a substitution address for use by at least one other device attached to the local network when communicating with the given device.

2. (Amended) The apparatus of claim 1 wherein the remotely-assigned address information comprises an Internet protocol (IP) address assigned to the given device by an external network element.

3. The apparatus of claim 1 wherein the local network comprises a local area network (LAN).

4. The apparatus of claim 1 wherein the gateway comprises an ADSL (asymmetric digital subscriber loop) termination unit-receive (ATU-R) device.

5. The apparatus of claim 1 wherein the gateway stores remotely-assigned address information for each of a plurality of devices attached to the local network.

6. The apparatus of claim 5 wherein the gateway stores a set of address substitution information for each of the plurality of devices, the set of address substitution information for a given one of the devices comprising an address to be used by the given device in communicating with the gateway, and addresses to be used by the given device in communicating with each of the other devices.

7. The apparatus of claim 6 wherein the stored information comprises an address substitution matrix having a row of address information for each of the plurality of devices attached to the local network.

8. (Amended) The apparatus of claim 6 wherein a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element.

9. The apparatus of claim 1 wherein the gateway processes a particular received packet in order to replace remotely-assigned address information in a header thereof with a corresponding substitution address determined by the gateway.

10. The apparatus of claim 1 wherein the gateway intercepts at least one of control information and maintenance information received over the local network and associated with the given device so as to perform related services on behalf of the given device.

11. (Amended) A method for use in interfacing a local network to one or more external network elements, the method comprising the steps of:

determining, in a gateway coupled between the local network and the one or more external network elements, remotely-assigned address information for a given device attached to the local network; and

establishing a substitution address for use by at least one other device attached to the local network when communicating with the given device, based at least in part on the remotely-assigned address information.

12. (Amended) The method of claim 11 wherein the remotely-assigned address information comprises an Internet protocol (IP) address assigned to the given device by an external network element.

13. The method of claim 11 wherein the local network comprises a local area network (LAN).

14. The method of claim 11 wherein the gateway comprises an ADSL (asymmetric digital subscriber loop) termination unit-receive (ATU-R) device.

15. The method of claim 11 wherein the gateway stores remotely-assigned address information for each of a plurality of devices attached to the local network.

16. The method of claim 15 wherein the gateway stores a set of address substitution information for each of the plurality of devices, the set of address substitution information for a given one of the devices comprising an address to be used by the given device in communicating with the gateway, and addresses to be used by the given device in communicating with each of the other devices.

17. The method of claim 16 wherein the stored information comprises an address substitution matrix having a row of address information for each of the plurality of devices attached to the local network.

18. (Amended) The method of claim 16 wherein a given one of the sets of address substitution information for a particular one of the plurality of devices comprises a set of IP addresses, each of which is sub-network compatible with an IP address remotely assigned to the corresponding device, such that communications between the given device and another one of the devices attached to the local network are not routed through an external network element.

19. The method of claim 11 wherein the gateway processes a particular received packet in order to replace remotely-assigned address information in a header thereof with a corresponding substitution address determined by the gateway.

20. The method of claim 11 wherein the gateway intercepts at least one of control information and maintenance information received over the local network and associated with the given device so as to perform related services on behalf of the given device.

21. (Amended) A machine-readable medium storing one or more programs for use in interfacing a local network to one or more external network elements, wherein the one or more programs when executed by a processor implement the steps of:

determining, in a gateway coupled between the local network and the one or more external network elements, remotely-assigned address information for a given device attached to the local network; and

establishing a substitution address for use by at least one other device attached to the local network when communicating with the given device, based at least in part on the remotely-assigned address information.